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Evaluation and Simulation of Urban Water Management from a Multi-Stakeholder Perspective

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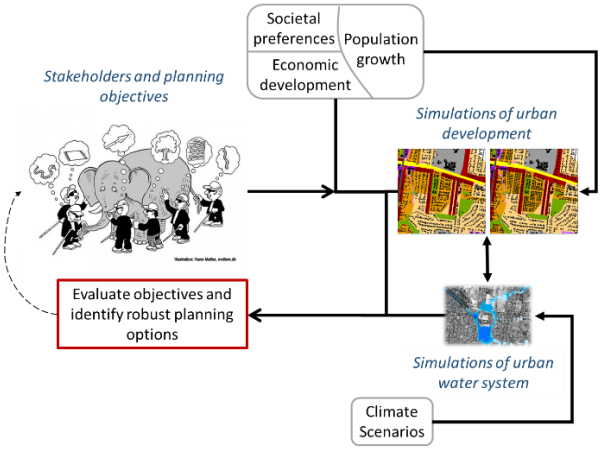
Multi-stakeholder approaches to urban water management are likely to consider water in earlier stages of the planning process. This can contribute to reduced risk of flooding (SDT1.5, 13.1), and promote the usage of urban infrastructures for multiple purpose. The latter leads to a reduced environmental footprint (SDT 11.6) and economic cost, as well as improved air quality if the implementation of green areas in urban spaces is promoted. However, in many countries the collaboration amongst stakeholders requires a re-negotiation of existing legal frameworks, and discussions on who benefits and who pays the bill will arise.



To facilitate discussions, it is necessary to know which stakeholders interact with urban water management and what their various objectives are. Based on a stakeholder analysis in Danish literature, as well as a series of workshops with relevant actors, we have condensed this information into a structured overview similar to Lienert et al. (2015), which can be used to identify which stakeholder should be involved in a planning decision. As a next step, we aim to quantify the objectives in simulations to assess the impact of planning decisions on various stakeholders preferences.

The quantification of planning objectives requires a modelling setup, which can link the effects of urban water management on various city planning parameters and vice versa. In addition, investments into water infrastructure as well as urban planning decisions can have consequences over time horizons of several decades and more, and need to be considered in a context of uncertain socio-economic and climate developments. For the city of Odense we extend the framework described by (Löwe et al., 2017) to perform assessment of a wide range of urban water management indicators for a variety of user-defined scenarios of climate and socio-economic developments.
Our framework enables collaborative efforts linking, for example, design of water management to aspects of urban mobility, recreation and health. Challenges arise from quantifying intangible objectives and the lack of experience with making decisions under uncertainty. These are the subject of on-going work.

Lienert, J., Scholten, L., Egger, C., Maurer, M., 2015. Structured decision-making for sustainable water infrastructure planning and four future scenarios. EURO J. Decis. Process. 3, 107–140.
Löwe, R., Urich, C., Sto. Domingo, N., Mark, O., Deletic, A., Arnbjerg-Nielsen, K., 2017. Assessment of Urban Pluvial Flood Risk and Efficiency of Adaptation Options Through Simulations – A New Generation of Urban Planning Tools. J. Hydrol. 550, 355–367.